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OPERATIONAL ART AND NATO C4I INTEROPERABITY—AN OXYMORON?

by

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The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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15.Abstract: Despite the numerous successes enjoyed by the North Atlantic Treaty Organization (NATO) for over fifty years, there are Command, Control, Communications, Computers and Intelligence (C4I) interoperability deficiencies that should be acknowledged and corrected. As NATO continues to modify its doctrine towards the updated mission of collective security in Europe, these C4I interoperability challenges are ever increasing in importance. C4I interoperability is important because it is the glue that binds the tenets of operational art that in turn is the foundation for doctrine. NATO's C4I interoperability challenges existed over the course of the Cold War and operations in both Bosnia and Kosovo. NATO's C4I interoperability challenges can be overcome by enhancing the Combined Joint Task Force (CJTF) concept, choosing future operational commanders from nations capable of providing a C4I architecture, ensuring future member nations are in compliance with appropriate C4I standardization agreements, and investing in Network Centric Warfare (NCW). NATO's future operational mission successes can very well be determined by the efforts placed in resolving the C4I interoperability challenges today.

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ABSTRACT

OPERATIONAL ART AND NATO C4I INTEROPERABITY—AN OXYMORON?

Despite the numerous successes enjoyed by the North Atlantic Treaty Organization (NATO) for over fifty years, there are Command, Control, Communications, Computers and Intelligence (C4I) interoperability deficiencies that should be acknowledged and corrected. As NATO continues to modify its doctrine towards the updated mission of collective security in Europe, these C4I interoperability challenges are ever increasing in importance. C4I interoperability is important because it is the glue that binds the tenets of operational art that in turn is the foundation for doctrine. NATO's C4I interoperability challenges existed over the course of the Cold War and operations in both Bosnia and Kosovo. NATO's C4I interoperability challenges can be overcome by enhancing the Combined Joint Task Force (CJTF) concept, choosing future operational commanders from nations capable of providing a C4I architecture, ensuring future member nations are in compliance with appropriate C4I standardization agreements, and investing in Network Centric Warfare (NCW). NATO's future operational mission successes can very well be determined by the efforts placed in resolving the C4I interoperability challenges today.

I. INTRODUCTION

The Cold War, Operations Sharp Guard, Deny Flight and Allied Force conjure a variety of images in the minds of political and military leaders regarding the North Atlantic Treaty Organization (NATO). NATO is often praised by political leaders for its success in maintaining over 50 years of peace and stability throughout Europe. In turn, military leaders are credited with developing the strategy necessary to achieve the political objectives set forth by the NATO civilian leadership.

Over the course of its history, NATO has had to simultaneously balance objectives and capabilities. NATO's essential purpose is to safeguard the freedom and security of all its members by political and military means in accordance with the principles of the United Nations Charter.[1] Despite its many non-confrontational successes, NATO has realized that to enforce its political will it must sometimes resort to a military solution. Herein lies a fundamental and important problem. NATO has no organic military assigned. It must depend upon the support of its nineteen member nations to contribute, as desired, military forces necessary to achieve NATO objectives. The assumption is that the alliance will seamlessly and immediately blend together in a harmonious manner. This assumption may be reality at strategic and tactical levels of war. At the operational level of war, however, it is an entirely different matter because transferring strategic desires into tactical success requires the application of operational art.

The intent of this paper is to explore the relationship between operational art and NATO doctrine while simultaneously explaining the significance that NATO Command, Control, Communications, Computers and Intelligence (C4I) interoperability has upon

this relationship. This intent will be accomplished by examining NATO's past and potential operational uses of military forces. Finally, recommendations on solving the operational dilemmas currently posed by NATO's C4I interoperability deficiencies will be proposed to the reader.

II. THE CHALLENGE

During the Cold War, NATO's theater of operations was clearly defined as Europe. Military planners tactically prepared for enemy attacks through the now famous Fulda Gap. If the enemy could not be controlled within the first several days, then strategy included the potential use of nuclear weapons. With the dissolution of the Soviet Union, this era has past. Although NATO's core mission of self-defense remains, it has redefined itself by both preparing and undertaking those necessary offensive missions that will maintain political stability throughout Europe. These new missions can be categorized as military operations other than war (MOOTW), for example, peace enforcement and non-combatant evacuations.

The successful accomplishment of these missions will predominantly be determined at the operational level of war wherein lies "an intermediate phenomenon [that] exist[s] between discrete tactics and wider strategy."[2] NATO's military threat is no longer static in nature. NATO's strategy and doctrine had to change to meet the military threat of tomorrow while maintaining deeply rooted in European traditions.

Carl von Clausewitz indirectly developed the concept of "operational art"; whereas, Helmuth von Moltke influenced the term "operational."[3] Based upon these European thinkers, operational art today is defined as "the employment of military forces

to attain strategic and/or operational objectives through the design, organization, integration, and conduct of strategies, campaigns, major operations, and battles."[4]

Furthermore, as contained within Joint Pub 3-0, there are fourteen tenets or pillars of operational art that include: synergy, simultaneity and depth, anticipation, balance, leverage, timing and tempo, operational reach and approach, forces and functions, arranging operations, centers of gravity, direct versus indirect, decisive points, culmination, and termination.[5] (Please see Appendix A.) A detailed discussion of these fourteen pillars is beyond the scope of this paper, however, it is important to note that they provide the foundation and impetus for military experiences that can eventually become the basis for military doctrine.

Military doctrine will only be as relevant as the fourteen pillars of operational art, yet there is another force at work as it pertains to operational art. That force is "interoperability." Interoperability directly influences the synergy necessary to maintain operational tempo while simultaneously reducing the friction and fog associated with warfare. Interoperability is the glue that binds and strengthens the fourteen pillars of operational art. C4I interoperability facilitates the application of operational art and therefore, the two are inextricably linked. C4I interoperability is a key enabler of the overarching operational goal of force integration–the fusing of the services and alliance partners into a unified military force that achieves high military effectiveness, exploiting and coordinating individual force capabilities.[6] The application of operational art and its tenets do not become a reality without C4I interoperability. Operational doctrine embodies this art and science while also providing the basis for preparing commanders and their forces for future operational warfare.

As NATO focuses its future mission towards collective security, it must aggressively address the issues and challenges of operational C4I interoperability to enhance operational readiness and future mission success. NATO must not allow the perceived successes of the Cold War, Bosnia, and Kosovo to overshadow the ever-increasing C4I interoperability deficiencies evident at the operational level. Failure to accept these deficiencies and, more importantly, correct them will result in doctrine that occupies space on a paper with no real relevance for future operational missions. Ultimately, NATO runs the risk of becoming an alliance possessing no military strength of unity.

Doctrine is based upon historical lessons learned and methods of warfighting that rely extensively upon interoperability. The importance placed on the formulation of consolidating doctrine is currently underway in NATO. Doctrine becomes ineffective in multinational missions where mutual support or coordination is a necessity and interoperability is deficient. An important perspective is that an alliance "must share a common doctrine to take advantage of commonalities."[7] This fact summarizes the importance of interoperability and the inextricable relationship in conducting NATO operations under a combined doctrine. Where interoperability is lacking, doctrine begins to wane and achieving mission success develops into an ever-greater challenge. Previously emplaced C4I interoperability procedures that are understood and established within an alliance will improve staff coordination and facilitate unity of effort. This principle will thwart an enemy's ability to exploit an inherit weakness of alliances—C4I interoperability.

NATO's unique means of formulating a military alliance often leads to severe interoperability challenges. These challenges are often masked by the ingenuity demonstrated at the tactical level of war, but they should be resolved at the operational level. NATO's previous mission successes have led the Alliance to postulate that all is well and that there is time to resolve any interoperability issues. This statement is far from the truth and has raised the question "Is Operational Art and NATO C4I Interoperability–An Oxymoron?" This question is not a rhetorical one. As NATO prepares to encounter missions ahead in the new millennium, its C4I interoperability deficiencies must be accepted and resolved.

III. THE CHALLENGE IS REAL

"Warfighting operations are the most demanding that a combined force will undertake in terms of complexity, friction and the difficulties of exchanging information."[8] At the operational level of war, the commander should know all forces involved, appreciate the limitations imposed by time, and understand the space where he may be called upon to exercise his profession.[9] The operational commander's intent needs to be disseminated and understood throughout his command. The primary means of fulfilling this requirement is through firmly established interoperability concepts. C4I interoperability enables the commander to exercise both operational art and the art of command. C4I interoperability is crucial to an alliance commander's ability to translate and transmit a decision while simultaneously maintaining proper situational awareness in order to make the next decision.

At its very inception, the NATO Alliance "lacked an integrated military command...NATO forces were not equipped or deployed to operate together."[10] Forces were constituted, deployed, and shared a singular mission of collective defense. Time became an ally to the Alliance's Cold War preparations. The Cold War provided NATO with a static environment whereby the operational commander knew and became acquainted with the space that he would have to conduct military operations. The mission statement was clear and understood to be self-defense (Article 5). Forces were constituted to delay the enemy until other strategic measures could be used. The operational commander knew the capabilities and limitations of his forces as well as those of his opponent. Centers of gravity, decisive points and other operational factors were fully developed because time was available to gain intelligence about the enemy. The rear, close and deep areas of operations were clearly defined and understood. Military operations were based upon doctrine that professed defense in depth using massive armies. As a result, the relationship between C4I interoperability and operational art was not fully developed.

Furthermore, the one rule of warfighting lost by NATO was that the enemy could outmaneuver its forces and tilt the balance of mission success in their favor. After the Cold War, it was learned that the Soviets' level of intelligence about NATO's forces and operational plans were much clearer than originally thought. If the Cold War transitioned to a war of actual combat, one can only guess about the consequences that would have befallen NATO's forces. Little synergy was required within NATO's operational forces to defeat the enemy because doctrine was based upon preconceived notions surrounding potential enemy courses of action that eventually were proven false. Critics would argue

that the end result of the Cold War vindicated the relevancy of the NATO Alliance, its military doctrine and preparedness. The contrary is now true as NATO has reidentified itself and restructured accordingly.

In an attempt to meet future challenges and C4I incompatibility issues, NATO has instituted two initiatives. First, the Partnership for Peace (PFP) program provides a forum and means for non-member nations located in Central and Eastern Europe to interact with alliance military forces to facilitate the development of similar military procedures and systems endemic to NATO. PFP's purpose is to enhance respective peacekeeping abilities and capabilities through joint planning, training and exercises. By accomplishing these principle objectives, the intent is to increase interoperability amongst NATO and PFP members.[11] The second concept is the Combined Joint Task Force (CJTF).[12] The purpose of the CJTF is to develop an integrated military structure providing improved operational readiness that is more flexible and allows for rapid mobile deployment of forces needed to respond to developing crises as determined by NATO.[13] Based upon the specific criteria of an assigned mission, a CJTF headquarters will be formed around a core headquarters and received augmentation from other NATO headquarters, member nations and contributing PFP countries. At the heart of the CJTF concept is an attempt to design a command and control architecture that allows these forces to integrate seamlessly. The idea is to build a unique headquarters for a specific mission by incorporating a building block approach.[14]

Immediately, the weaknesses are apparent. The operational commander of this CJTF will have a staff and an ad hoc alliance of forces that have infrequently worked together to fulfill a time critical mission successfully. C4I interoperability when it is

required most, at the commencement of a mission, will not exist. The effect is to weaken the commander's ability to practice operational art. Hence, the requirement for a flexible NATO that is prepared to meet the challenges of tomorrow will fail to become a reality.

Operational commanders now prepare for the unknown missions by preparing for all potential missions. NATO commanders have the additional challenge of integrating forces into a multinational alliance. These joining forces each possess unique doctrine and a variety of C4I capabilities or incompatibilities that must be brought together under the guidance of NATO doctrine. Unifying the efforts of all forces with a variety of capabilities to an unknown location for an unspecified mission for an undetermined amount of time would be greatly enhanced under an enforced standardization C4I interoperability agreement. Although NATO does have such agreements, C4I interoperability continues to be a source of consternation among NATO operational commanders. This frustration became readily apparent after the first NATO post Cold War test—Bosnia.

Bosnia provided the first venue where NATO member and non-NATO member nations participated side by side. Despite the "successes" of the NATO Implementation Force (IFOR) and Stabilization Force (SFOR), there were many strains that became apparent. Interoperable multinational headquarters, the future norm within NATO assigned missions, remained a concept rather than a reality. "There remains no standard organizational 'template' to which the multinational land headquarters declared to the Alliance adhere."[15] The operational commander's ability to make decisions and implement them accordingly came into jeopardy. This lack of interoperability hindered the commander's ability to influence his, as well as his enemy's, decision-making cycle or

OODA (Observation-Orientation-Decision-Action) cycle (developed by Colonel Boyd, USAF). After Bosnia, former United States Secretary of Defense Cohen stated that "When you conduct an operation at a distance—even a small distance—deficiencies in mobility, communications, and sustainment become more than minor inconveniences—they become fatal impediments to mission success...units from different nations could not talk to one another because of incompatible equipment."[16]

NATO continues to balance member nations abilities and willingness to support future training exercises and missions. The availability of standing and mobilization forces made by nations to the Alliance has been steadily reduced. There are inadequate numbers of deployable reaction headquarters, both at the corps and component command level that would or can support a commander of a NATO Combined Joint Task Force.[17] Inherent to this observation is the realization that attempts at standardizing and achieving C4I interoperability is becoming increasingly difficult.

One unknown variable that must be taken into consideration involves the motives and mannerisms of a future NATO adversary. As NATO continues to grapple with new doctrine, future missions, unassigned forces, new member nations, it must not overlook the potential capabilities of its future enemy. Moltke the Elder once stated that "an enemy always seemed to have three alternatives open to him and he usually chose the fourth."[18] Any lapse in NATO interoperability at the operational level becomes an immediate critical weakness that could become exploited. NATO needs to look no further than operations in Kosovo to relearn valuable C4I interoperability lessons.

NATO's involvement in Kosovo highlights the critical requirement for C4I interoperability. "The operational environment in the Balkans today—as will be true of

most future contingencies—is essentially different. It is complex."[19] Once again, known C4I interoperability concerns were not corrected prior to the development of an immediate crisis. Operational command and control, maneuver, fires and logistics can only be attained through uninhibited exchange of information. The Kosovo campaign, once again, identified "deficiencies in command-and-control and information systems, [and] secure communications."[20] There were interoperability successes demonstrated during Operation Allied Force. These successes included the use of web-oriented technologies to share information, extensive use of e-mail, and video teleconferencing used for operational coordination amongst commanders.

However, the problems of C4I interoperability ranged from coordinated use of limited bandwidth to enforcing NATO agreements covering network security. One of the more striking concerns was the lack of "network integration training standards for Commander Joint Task Force (CJTF) command, control, communications, and computers."[21] Operational art could not be effectively and efficiently used during this operation. "NATO after-action reports stress that Milosevic may have intercepted NATO communications and warned targets that they were about to be hit."[22] Numerous "email" type systems of various classifications were never melded into one. Creative solutions had to be developed to overcome C4I interoperability issues. Regrettably, zeal "to get the information out" resulted in some of these solutions jeopardizing operational security. Additionally, we should not forget that former and future adversaries are quick to realize that technology is essential to interoperability. They too can purchase technological advances to enhance their interoperability while attempting to disrupt their adversaries, including the NATO Alliance. During the Kosovo operation, the fog of war existed as it

would in any armed conflict; however, the Alliance's C4I interoperability shortfalls increased the friction of war as well. NATO must realize that this approach will not be successful for future missions.

As a result of the Alliance's experiences in the Balkans, the lessons learned can best be summarized by the following comment: "It is sobering to note that over the last decade we witnessed a growing technological gradient rather than a convergence of national capabilities. If it widens, this gap will be troubling for Alliance unity in crisis."[23] The message is clear. The C4I interoperability shortages that are prevalent when NATO undertakes an operational mission must be corrected before additional, perhaps costly, lessons are learned.

IV. RECOMMENDATIONS ON OVERCOMING THE CHALLENGE

Over the past fifty years, NATO has continually relearned the same C4I interoperability lessons. NATO too recognizes that "[t]here is a need to further improve interoperability and sustainability among allied forces. In the future, these forces must be on the same wavelength and able to move long distances effectively and quickly. They must be able to communicate service to service and ally to ally in a world where information technologies are becoming part of the soldier's basic kit."[24] The Alliance must resolve itself to use the present to prepare for future unknowns by acknowledging that there is a C4I interoperability dilemma that requires action vice desires. "[I]nteroperability, once trumpeted as a future goal, is now an operational imperative."[25]

One approach undertaken by NATO that shows considerable promise towards improving C4I interoperability is the CJTF concept. NATO's member nations have made commitments to standardize both headquarters and C4I systems. NATO doctrine must be

accepted as the training foundation for future missions. Training must be real and dynamic vice scripted. Staffs should receive training that emphasizes the development of situational awareness while simultaneously developing the staff in a coordinated approach towards supporting the commander. The CJTF concept will enable unity of command to become a reality instead of a desired end state.

As member nations of NATO continue to improve C4I systems (in compliance with NATO standardization agreements), new approaches should be considered in the selection of a future operational commander. "The Kosovo campaign made it apparent that increased emphasis must be given to concepts of operation. Although technology is important, it is not the only path to success."[26] For instance, nations such as the United States and Great Britain should provide the commanders necessary to occupy key leadership billets within a future CJTF. Similarly, member nations must declare core occupants of key CJTF billets to facilitate training and readiness.[27] The mission of tomorrow will not provide NATO with the luxury of time necessary to create a formidable force.

There are political sensitivities associated with this radical approach; however, other nations can make significant contributions based upon national capabilities. Operational logistics and fires are examples where member nations can make an important impact upon operational successes. Additionally, member nations that do not provide the personnel to command a CJTF can provide deputy commanders so that they can continue to refine their skills necessary to operate in a multinational environment. An incentive inherently exists for member nations to comply with standardization agreements. During peacetime, investments made in the form of training and

headquarters staff selections are a small price to pay for the future dividend of mission success.

The Joint Communications Support Element (JCSE) is a resource available to American operational commanders. The JCSE provides a rapidly deployable C4I suite that provides the commander with immediate C4I interoperability with other forces on a temporary basis. Vertical and horizontal command and control can be temporarily established until a more permanent C4I architecture can be built. NATO can incorporate a similar concept into its infrastructure to handle missions requiring immediate C4I interoperability. The cost of creating such a tool is high indeed; however, the cost of mission failure is even higher. One alternative would be for the wealthier member nations to finance initial investments in establishing a JCSE like architecture. This approach would guarantee that the operational commander would have sufficient resources to accomplish assigned missions. As previously proposed, the nations capable of investing in NATO's C4I architecture will also be the same nations whose military leaders will use the acquired resources. The only difference is that NATO will take ownership of the equipment to train and refine operational skills as necessary.

NATO's C4I architecture must be continually reviewed and tested for feasibility. Cellular telephones and other type devices are not the solution. Rather, the Defense Capabilities Initiative (DCI) has identified essential commonalities that are a prerequisite for a standardized C4I architecture.[28] The Kosovo campaign has taught the Alliance that it must continue to correct C4I deficiencies by building upon the C4I achievements. NATO's Consultation, Command and Control Organization (NC3O) is responsible for this procedure. NC3O's authority should reflect its responsibilities. Additionally, NATO

doctrine must be reflected in every effort orchestrated by the NC3O. Alliance members must review national blockages towards achieving alliance C4I interoperability objectives. NATO needs to develop a measure of operational C4I effectiveness that requires member nations to report the status of C4I systems.[29] C4I interoperability is a force multiplier in combat as well as peacekeeping missions. NATO members can ill afford to wait until the next operation to determine the readiness of its member nations.

As NATO members ponder its future enlargement, strict adherence towards admission standards is an operational necessity. NATO's PFP enables non-member nations to participate alongside NATO members in training and real world contingencies. During real world contingencies, there have been favorable results attained with PFP participants. However, the reality is that PFP participants are lacking in C4I systems to enhance interoperability. PFP participants that want to enter NATO must fully subscribe to its interoperability requirements. NATO members must not allow politics to be the decisive factor as to whether or not the requesting nation may enter the Alliance. Entrance to NATO with little regard for operational functions will have catastrophic effects on future military missions. "Article 5 of the NATO Charter should serve as a clear reminder that NATO is not a club but a military alliance."[30] This reminder should not terminate a PFP participant's goal towards admission; rather, it should serve as the starting point. PFP participants should continue to engage in NATO missions to the best of their abilities as they strive for NATO uniformity.

Joint Vision 2020, published by the United States Chairman Joint Chiefs of Staff, contains an acknowledgement that "[o]ur more technically advanced allies will have systems and equipment that are essentially compatible, enabling them to interface and

share information in order to operate effectively with US forces at all levels. However, we must also be capable of operating with allies and coalition partners who may be technologically incompatible..."[31] As NATO enters the 21st century preparing to engage the unknowns of tomorrow, it must begin to invest in today's technology to establish a benchmark for future innovations that will contribute to the mission successes of tomorrow. Currently, one such approach is underway in the United States military. Network Centric Warfare (NCW) offers substantial hope for resolving the myriad of interoperability challenges prevalent today and tomorrow.[32]

NCW incorporates technology as a facilitator towards developing and enhancing the synergy necessary to leverage operational functions and art against the enemy in order to defeat him. NCW will become a force multiplier, especially in alliance warfare. "Information technologies will, at the operational level, be used to synchronize integrated operations conducted at high-tempo, with high lethality and high mobility, throughout the depth and extent of the theater."[33] The operational commander will be able to incorporate a wide variety of resources and consolidate their inputs into a near real time common operational picture that will enhance the overall situational awareness or "battlespace awareness" of both the commander and his staff. Equally important is the increased rate of information flow among operational commanders and staffs.

The investments necessary to incorporate NCW will be considerable, but since technology is being developed at an incremental rate initial investments can be made by all nations to establish a technological benchmark. Basically, the initial technological investments made by NATO members are the investments made in fulfilling current technological standardization agreements. Those NATO nations that cannot afford

current technological upgrades must not be forgotten. Since the majority of financial burden in technological research occurs at the beginning, the United States' can offer its discoveries to NATO nations. Additionally, NCW can be developed with a "backwards compatible" approach towards systems integration by using the NATO C4I interoperability standardization agreements as the benchmark. To ensure funding for future NCW improvements, NATO technological standardization agreements must be complied with by all member nations. PFP nations too must comply with the standardization agreements before being accepted into NATO. Although this approach requires a substantial commitment by the United States, the United States will benefit because its national interests and security will remain safeguarded.

The previously mentioned approach to resolving interoperability challenges is not without opposition. Recently, General Reinhardt, former commander of Kosovo Forces, has argued that one nation should not take the lead in developing an all encompassing approach (such as NCW) to resolving C4I interoperability shortfalls. Additionally, he notes "[y]ou will never get a single overarching [solution]. I think that's dreaming about a world that is not there because all nations try to develop their own systems and their industry and their money."[34] Furthermore, General Reinhardt mentions that nations should "see what the others have and buy from them. Buy off the shelf."[35]

General Reinhardt implicitly highlights that no member nation's sovereignty with regards to advancements in technology should be jeopardized. With respect to this argument, NATO cannot forsake C4I interoperability as the expense of NATO unity. Member nations know what is expected of them by belonging to NATO. Although NATO has successfully survived the Cold War, Bosnia operations and the Kosovo

campaign, it has not successfully corrected C4I interoperability deficiencies. The ability to rapidly deploy forces to future missions requires investment in military readiness today. NATO cannot wish the C4I interoperability problem away. Rather, it should accept bold approaches such as those outlined above.

V. CONCLUSION

"Interoperability is a vital technical aspect of deepening trust."[36] This statement encapsulates the importance that C4I interoperability is to doctrine. Doctrine is based upon commonly accepted ways of using means to accomplish the ends stated by a commander. Doctrine's foundation is built upon operational art and provides the commander with a starting point from whence to commence an operational mission. Interoperability provides the bonds necessary to implement the characteristics of operational art. NATO's attempts at establishing a unifying doctrine should be applauded. The time is now for Alliance members to bring doctrine in line with available technology to enhance C4I interoperability. Otherwise, the NATO doctrine established will be for naught. "A military force is only as effective as its flow of information, and NATO must have a fully interoperable communications capability for the next century to be successful."[37]

In the past, NATO relied extensively upon the use of liaison officers for disseminating the commander's guidance and staff coordination. Today, NATO is balancing the use of both liaison officers and technology to accomplish the same objective. Tomorrow, NATO must learn from the past while keeping an eye towards the future. Current and future NATO members need to adhere to those standardized

agreements that address doctrine, operational art and C4I interoperability. Additionally, new approaches must continue to be explored and those found capable of increasing mission readiness need to be incorporated expeditiously. In the interim, training of CJTF assigned personnel in NATO doctrine and interoperability must continue with fervor and freedom. Furthermore, operational commanders that are charged with potential missions need to be provided with the C4I interoperability capabilities similar to those provided by the JCSE. NCW provides NATO with a viable means of improving C4I interoperability in the future. Investments in NCW must continue and dividends shared with all members of the Alliance.

Finally, there is a unique responsibility placed upon the United States. "The United States [has] contributed far more resources and capabilities to NATO than any other single Ally...[W]e can[not] expect our Allies to match our military power in every category or to act contrary to their perceived interests. The Alliance has proved so strong precisely because its members have not allowed their difference ever to rival, in scope or depth, their shared interests."[38] The United States cannot forget that NATO is an Alliance of significant importance that will continue to grow as long as the Alliance deems it important. The United States has the obligation through controlled patience to continue supporting measures that will enhance the operational readiness of NATO and its present and future member nations.

The Alliance needs to appreciate the relationship between operational art and C4I interoperability and the impact this relationship has upon doctrine. NATO needs to realize that the benefits from the seamless integration of doctrine and C4I interoperability is more than a goal for future mission success, it is a requirement. In order to increase the

likelihood of future mission success, it is now time for NATO to demonstrate the bold leadership necessary to resolve C4I interoperability issues before it is too late. Let the answer be no to the question "Is operational art and NATO C4I interoperability an oxymoron?"

NOTES

[1] North Atlantic Treaty Organization, NATO Handbook: 50th Anniversary Edition (Brussels: NATO Information and Press, 1998-1999), 23.

[2] B.J.C. McKercher and Michael A. Hennessy, eds., Introduction to The Operational Art: Developments in the Theories of War (Westport, CT:Praeger Publishers, 1996), 1.

[3] John English, "The Operational Art: Developments in the Theories of War," In The Operational Art: Developments in the Theories of War, edited by B.J.C. McKercher and Michael A. Hennessy, (Westport, CT: Praeger Publishers, 1996), 7-8. Additionally, Moltke understood that operations "meant planning and controlling the movement of large army formation–corps and armies (forces)–in the area of operation (space) to concentrate all available forces at the day of the battle (time) out of different directions for one decisive battle, which should result in a quick decision." (Dieter Brand, "The Origins of *freie Operationе,"* Almanac, <http://www-cgsc.army.mil/milrev/English/JulAug00/almanac.htm> [11 January 2001].)

[4] Joint Chiefs of Staff, Doctrine for Joint Operations, Joint Pub 3-0 (Washington, DC: 1 February 1995) GL-10. Additionally, Operational art helps commanders use resources efficiently and effectively to achieve strategic objectives. It provides a framework to assist commanders in ordering their thoughts when designing campaigns and major operations. Operational art helps commanders understand the conditions for victory before seeking battle, thus avoiding unnecessary battles. Without operational art, war would be a set of disconnected engagements, with relative attrition the only measure of success or failure. (Joint Chiefs of Staff, Doctrine for Joint Operations, Joint Pub 3-0 (Washington, DC: 1 February 1995) II-2 and II-3.)

[5] Ibid., III-10.

[6] "Realizing the Potential of C4I," <http://www.nap.edu/htmo/C4I/ch2.html> [17 December 2000].

[7] Additionally, "Doctrine is more than simply how we intend to fight. It is also the technical language with which we communicate commander's intent, battlefield missions, control measure, combined arms and joint procedures and command relationships. Doctrine is not contained simply at one level of war-strategic, operational or tactical-it embodies all...In the absence of a commonly understood doctrine, it becomes extraordinarily difficult to plan or execute military operations." (Robert W. RisCassi, "Doctrine for Joint Operations in a Combine Environment: A Necessity," Military Review, (January-February 1997): <http://www-gsc.army.mil/milrev/English/janfeb97/riscassi.htm> [17 December 2000].)

[8] North Atlantic Treaty Organization Brussels, Framework Paper on the Requirement for Combined/Joint Interoperability between C2 Systems Supporting NATO Operations within the Land Component, (Brussels: NATO Army Armaments Group, 1998), 6.

[9] At the operational level [of war], the commander's role is to so employ his resources so that he achieves his strategic objectives. To fulfill this obligation he must first have trained his command that they accept and fully understand his concept of operations and can carry it out. Then he must have an efficient system of finding out about his enemy and of quickly sorting out and assessing all the data collected. Then he must plan to seize the initiative, get on the offensive and go all out to win. This means constantly planning ahead for the next battle. He must issue orders in good time for his subordinate tactical commanders to act. To some extent he is involved in battle management...but he must also command otherwise he will never dominate his campaign." (Sir Michael Farndale, "Command and Control of the Joint Army Group/Tactical Air Force Battle at the Operational Level," in Military Strategy in a Changing

Europe Towards the Twenty-first Century, edited by Brian H. Reid and Michael Dewar, (Brasseys, Great Britain: B.P.C.C. Wheatons Ltd., 1991), 182-183.)

[10] Richard L. Kugler, "NATO Chronicle: The Cold War Years," Joint Force Quarterly, (Spring 1999): 9.

[11] North Atlantic Treaty Organization, NATO Handbook: 50th Anniversary Edition (Brussels: NATO Information and Press, 1998-1999), 86-87.

[12] CJTFs will be multiservice, multinational task forces capable of rapid deployment for limited duration peace operations conducted beyond the borders of the Alliance and under the control of NATOand WEU. (Michael E. Firlie, "NATO Standing Combined Joint Task Forces," Joint Force Quarterly, (Autumn/Winter 1999-2000): 34.)

[13] North Atlantic Treaty Organization, NATO Handbook: 50th Anniversary Edition (Brussels: NATO Information and Press, 1998-1999), 76.

[14] Ibid., 260-261.

[15] As demonstrated in the Stabilization Force (SFOR) experience, three NATO division headquarters were deployed to the theater under the Allied Command Europe Rapid Reaction Corps (ARRC). These divisions included subordinated forces with which these headquarters had had no peacetime habitual training relationships (to include units from non-NATO nations). (Thomas-Durell Young, Multinational Land Forces and The NATO Force Structure Review, (U.S. Army War College, Carlisle Barracks: Strategic Studies Institute, June 2000), 12.)

[16] William S. Cohen, "Shaping NATO To Meet The Challenges of the 21st Century," remarks to the Defense Planning Committee: 11 June 1998. <http://www.infowar.com/mil_c4i_061298a_j.html-ssi> [17 December 2000].)

[17] Douglas C. Lovelace, Jr., foreword to Multinational Land Forces and The NATO Force Structure Review, by Thomas-Durell Young, (U.S. Army War College, Carlisle Barracks: Strategic Studies Institute, June 2000), iii.

[18] Philip Cox and James M. Hudson, Jr., "NATO Exercise Programs: A Case for Improvement," Joint Force Quarterly (Spring 2000): 77: quoted in Martin van Crevald, Command in War (Cambridge, MA: Harvard University Press, 1985), 8.

[19] Wesley K. Clark, "Meeting Future Military Challenges to NATO," Joint Force Quarterly, (Spring 1999): 43.

[20] Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, (Washington, DC: 31 January 2000), xix.

[21] Ibid., 27.

[22] The testimony of Secretary Cohen and General Shelton supports this thesis. They indicated that NATO lacked interoperable secure communications, forcing reliance on nonsecure methods that compromised operational security. This statement speaks poorly about the progress of communications technology, compatibility, and information superiority in NATO after 50 years of practice (an in this case with no enemy radio-electronic opposition of any consequence). (Timothy L. Thomas, "Kosovo and the Current Myth of Information Superiority," Parameters, (Spring 2000): 15.)

[23] Wesley K. Clark, "Meeting Future Military Challenges to NATO," Joint Force Quarterly, (Spring 1999): 44.

[24] Javier Solana, "NATO: Prospects for the Next Fifty Years," Joint Force Quarterly, (Spring 1999): 39.

[25] Wesley K. Clark, "Meeting Future Military Challenges to NATO," Joint Force Quarterly, (Spring 1999): 46.

[26] Joseph E. Eash, III, "Harnessing Technology for Coalition Warfare," NATO Review, (Summer/Autumn 2000): 34.

[27] Thomas-Durell Young, Multinational Land Forces and The NATO Force Structure Review, (U.S. Army War College, Carlisle Barracks: Strategic Studies Institute, June 2000), 13.

[28] Department of Defense, Report to Congress: Kosovo/Operation Allied Force After-Action Report, (Washington, DC: 31 January 2000), 25.

[29] "Realizing the Potential of C4I," <http://www.nap.edu/htmo/C4I/ch2.html> [17 December 2000].

[30] Kent R. Meyer, "US Support for Baltic Membership in NATO: What Ends, What Risks?" Parameters, (Winter 2000-01): 75.

[31] Joint Chiefs of Staff, "Joint Vision 2020: America's Military: Preparing for Tomorrow," (Washington, DC: Department of Defense): 22, <http://www.dtic.mil/jv2020/jvpub2.htm> [21 January 2001].

[32] The operational level of war revolves around commanders, their staffs, and their relationships with other elements of the warfighting ecosystem. The shift to network-centric operations has the potential to not only change existing command relationships, but to create new kinds of command relationships, as well as new type of commanders. NCW is about human and organizational behavior. NCW is based on adopting a new way of thinking—network-centric thinking—and applying it to military operations. NCW focuses on the combat power that can be generated from the effective linking or networking of the warfighting enterprise. It is characterized by the ability of geographically dispersed forces (consisting of entities) to create a high level of shared battlespace awareness that can be exploited via self-synchronization and other network-centric operations to achieve commanders' intent. NCW supports speed of command—the conversion of superior information position to action. NCW is transparent to mission, force size, and geography. Furthermore, NCW has the potential to contribute to the coalescence of the tactical, operational, and strategic levels of war. In brief, NCW is not narrowly about technology, but broadly about an emerging military response to the Information Age. (David S. Alberts, John J. Garstka, and Frederick P. Stein, Network Centric Warfare: Developing and Leveraging Information Superiority, 2nd Edition (Revised), (Washington, DC: CCRP 1999), 82, 83 and 88.)

[33] Stephane Lefebvre, Michel Fortmann, and Thierry Gongora. "The Revolution in Military Affairs: Its Implications for Doctrine and Force Development Within the U.S. Army." In The Operational Art: Developments in the Theories of War, edited by B.J.C. McKercher and Michael A. Hennessy, (Westport, CT: Praeger Publishers, 1996), 176.

[34] Maryann Lawlor, "Building a Pillar of Peace: Multinational Strength Buttresses Efforts to Meet Evolving World Challenges,." Signal, (September 2000): 50.

[35] Ibid.

[36] Lawrence B. Wilkerson, "What Exactly Is Jointness?" Joint Force Quarterly, (Summer 1997): 67.

[37] William S. Cohen, "The Atlantic Alliance: A View from the Pentagon," Joint Force Quarterly, (Spring 1999): 33.

[38] U.S. Department of Defense, "Strengthening Transatlantic Security: A U.S. Strategy For The 21st Century," (Washington, DC: December 2000), 61.

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